



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,523	09/22/2003	Luc Wolff	PET-2102	5857
23599 7590 05/28/2008 MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201				
EXAMINER				
SINGH, PREM C				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
05/28/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/666,523

Applicant(s)

WOLFF ET AL.

Examiner

PREM C. SINGH

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-47 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 21-37 and 39-47 is/are rejected.
7) ☒ Claim(s) 38 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 11 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Amendment to claims 21 and 43 and addition of new claims 44-47 is noted.

The amendment filed 03/25/2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Claim 44 (New) (lines 2 and 3): The examiner could not find the support for excluding the "addition of steam" in the dehydrogenation process.

Applicant cites page 15, lines 11 through 17 of the specification for the support of claims 44-47. However, the cited paragraph shows only catalyst composition but no support for excluding steam in the dehydrogenation process.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1797

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 21-37, and 39-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magne-Drisch et al (US Patent 6,369,287) in view of Lee (US Patent 3,306,942).

6. With respect to claims 21, 22 and 43, Magne-Drisch invention discloses a process for co-producing ethyl benzene and paraxylene, which comprises the following steps:

A feedstock that is provided via a supply line (1) and comprises a mixture of p-xylene, o-xylene, m-xylene, and ethyl benzene is introduced into a first adsorption unit (2). This unit comprises chromatographic columns that are filled with an adsorbent, and it operates according to the principle of a simulated counter-current moving bed. Said unit comprises four chromatographic zones. A raffinate that consists essentially of o-xylene and m-xylene and ethyl benzene and desorbent is recovered via a line (3). The desorbent which is toluene that is introduced via a line (6a) makes it possible to desorb via a line (4) an extract that consists of essentially pure p-xylene and toluene that is distilled and recycled (not shown in the Figure) (See column 5, lines 9-22). The raffinate is sent via line (3) into a distillation column (5) which feeds a toluene distillate via a line (6) that is optionally recycled and a residue. The latter is introduced via a line (7) into a second adsorption unit (8) that operates as first unit (2), according to the principle of the simulated countercurrent moving bed. A raffinate that contains desorbent and m-xylene and o-xylene is drawn off via line (10) while an extract that contains basically essentially pure ethyl benzene and desorbent is desorbed by the toluene that is introduced via a line (12 a). This draw-off is carried out via a line (9) downstream from the line for introducing desorbent into unit (8) (See column 5, lines 23-37). The raffinate is sent into a distillation column (11) that feeds a toluene distillate via a line (12) and a residue of o-xylene and m-xylene via a line (13). At least a portion of this residue can be introduced into a distillation unit (18) via a line (17). Said unit (18) makes it possible to recover an essentially pure m-xylene distillate via a line (19) and an essentially pure o-xylene residue via a line (20). The other portion of the residue is sent into an isomerization unit

Art Unit: 1797

that operates with or without hydrogen that is introduced via a line (15). The isomerate that is collected via a p-xylene-enriched line (16) essentially contains no ethyl benzene and is mixed at line (1) (See column 5, lines 39-54). Also, preferably by a standard method that is not shown in the figure, at least some of C₉+ compounds are eliminated from the isomerate (See column 5, lines 56-59).

It is to be noted that Magne-Drisch invention does not specifically mention about a distillation column (2) as claimed, but the invention does mention separation of C₉+ compounds from the isomerate which eventually becomes feed for the adsorption unit. Thus, it would have been obvious to one skilled in the art at the time then invention was made to modify Magne-Drisch invention and add a distillation unit before the adsorption step as claimed to eliminate C₉+ compounds.

Magne-Drisch invention discloses that the ethyl benzene production line is generally integrated into a plant for producing styrene (See column 2, lines 35-37), but it does not disclose dehydrogenation step of ethyl benzene to styrene.

Lee invention discloses an improved process for the dehydrogenation of alkyl aromatic hydrocarbons such as ethylbenzene to styrene (see column 1, lines 9-12).

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention by including a dehydrogenation step as suggested by Lee and take the stream (9) consisting of 99% pure ethylbenzene (See column 8, line 26) and convert it to styrene to make the process more profitable and useful due to numerous applications of styrene.

Art Unit: 1797

7. With respect to claim 23, Magne-Drisch discloses, "A raffinate that consists essentially of orthoxylene and metaxylene and ethyl benzene and desorbent is recovered line (3). The desorbent which is toluene that is introduced via line (6a) makes it possible to desorb via a line (4) an extract that consists essentially of pure paraxylene and toluene that is distilled and recycled (not shown in the figure)." (Column 5, lines 17-23).

8. With respect to claim 24, Magne-Drisch discloses in the figure adsorption column (2) operating in 5 zones. The figure showing streams (3), (3a), (4), (6a), and combination ((1) and (16)) of Magne-Drisch respectively represent the claimed streams (7c), (7b), (7a), (5), and (3).

9. With respect to claim 25, Magne-Drisch discloses in the figure where the first raffinate product (3a) is distilled in distillation column (11) to eliminate toluene (12), and then taken to the isomerization zone (14). The second raffinate product (3) goes to the distillation column (5) to remove toluene (6) and then to the second adsorption column (8). It is to be noted that stream (3) comprises essentially of orthoxylene, metaxylene, ethyl benzene, and toluene. Although the figure does not show a dehydrogenation unit, since the stream contains ethyl benzene, it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention and take the stream (7) to a dehydrogenation unit to convert ethyl benzene to styrene to make the process more profitable by producing styrene.

Art Unit: 1797

10. With respect to claims 26 and 27, Magne-Drisch discloses the adsorbent used in the first adsorption column to be X zeolite exchanged with barium or a Y zeolite exchanged with potassium and barium (See column 4, lines 43-45) and titanasilicate containing adsorbent in the second column (See column 4, lines 66-67).

Although Magne-Drisch does not disclose using X or Y zeolites in the second adsorption column but it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention and use X or Y zeolites because they are functionally similar to the adsorbent disclosed by Magne-Drisch.

11. With respect to claims 28 and 29, Magne-Drisch discloses the desorbent of the first and second adsorption columns as toluene or paradiethylbenzene (See column 4, lines 39 and 58).

12. With respect to claim 30, Magne-Drisch discloses the volumetric ratio of desorbent to feedstock for the first adsorption column = 1-2 and for the second adsorption column = 1-3 (See column 4, lines 36-37 and line 59).

13. With respect to claim 31, Magne-Drisch discloses the first adsorption temperature = 100-200°C and pressure = 2-30 bar (See column 4, lines 34-35).

14. With respect to claim 32, Magne-Drisch discloses the second adsorption temperature = 100-200°C and pressure = 2-30 bar (See column 4, lines 56-57).

Art Unit: 1797

15. With respect to claim 33, Magne-Drisch discloses that the first adsorption column contains 6-24 number of beds (See column 4, line 38) and 4 zones (see column 5, lines 15-16). Thus clearly, each zone has more than 3 beds.

16. With respect to claim 34, Magne-Drisch discloses that the second adsorption column contains 6-24 number of beds (See column 4, lines 53-54) and 4 zones (See column 5, lines 31-32).

Although Magne-Drisch does not specifically mention the number of beds in the second zone, but it would have been obvious to one skilled in the art to keep required number of beds, including the number as claimed, in the second zone for an effective separation.

17. With respect to claim 35, Magne-Drisch discloses, "A process for separation of p-xylene by adsorption (US 2,985,589 and US 3,626,020), whose effluents are p-xylene, on the other hand, and an aromatic C8 fraction that is substantially free of p-xylene, on the other hand. Crystallization can be combined with the adsorption stage to obtain p-xylene that is more pure." (Column 1, lines 13-22).

Although Magne-Drisch does not disclose the details of the crystallization process and recycle of mother liquor to the separation column, it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention and recycle the mother liquor to enhance the production of paraxylene.

Art Unit: 1797

18. With respect to claim 36, Magne-Drisch does not specifically mention about a distillation column (2) as claimed but suggests a separation unit before adsorption as discussed under claim 21.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention and include a distillation column before adsorption step. Also, it would have been obvious to take the separated C₉+ fractions in a distillation column for final recovery of any xylenes.

19. With respect to claim 37, Magne-Drisch discloses a separation step (8) of adsorption for stream (7) which is equivalent to the claimed step (20) for the claimed stream (18).

20. With respect to claims 39, 40, and 42, Magne-Drisch discloses in the figure stream (13) which is equivalent to the claimed stream (23b). The figure also shows stream (13) going to the isomerization zone (14) which is equivalent to the claimed isomerization zone (24).

Magne-Drisch further discloses, "Because the recycling of the isomerate that contains very little ethyl benzene in said unit leads to a reduction in the concentration of ethyl benzene of the adsorption feedstock." (Column 3, lines 25-29).

Magne-Drisch also discloses, "The process of invention can be used in liquid phase or in gas phase." (Column 7, lines 1-2).

Although Magne-Drisch invention does not specifically mention about quantitative value of ethyl benzene, it does mention "very little", thus it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention and use ethyl benzene content less than the claimed concentration to reduce load on the adsorption columns.

21. With respect to claim 41, Magne-Drisch discloses, "The mixture that is treated in the zone for separating xylenes (2) consists of 28 wt % fresh feedstock (line 1) and 72 wt % by weight of aromatic compounds with 8 carbon atoms that are obtained from the effluent of the isomerization zone (line 16)." Column 7, lines 40-44).

Although Magne-Drisch does not use a distillation column (2) as claimed, but as discussed under claims 21 and 36, it would have been obvious to one skilled in the art at the time the invention was made to modify Magne-Drisch invention and use a distillation column to remove C₉ and higher components from the feed prior to adsorption step.

22. With respect to claim 44, Lee invention discloses that steam is preferably employed in large amounts for example 2-30 mols/mole hydrocarbon (See column 4, lines 10-13). Obviously, use of steam is not critical in the dehydrogenation process.

23. With respect to claims 45-47, Lee invention discloses that dehydrogenation catalyst usually contains as a primary active constituent certain metals of Groups IV to

Art Unit: 1797

VIII. It is to be noted that tin belongs to Group IV A and chromium belongs to Group VI B. Lee also discloses that iron can be used with minor amounts of chemically bound chlorine but cautions that iron does not provide maximum activity and/or maximum selectivity of reaction (See column 1, lines 28-55; column 2, lines 10-14). Thus, it would have been obvious to one skilled in the art at the time the invention was made to use a catalyst containing tin and chromium and free of chlorine and iron for higher activity and selectivity.

Double Patenting

24. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thornton*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

25. Claims 21-37, and 39-43 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,841,714. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Although the '714 claims do not include recycle of desorbent as the claimed invention, it would have been obvious to one skilled in the art at the time the invention was made to modify '714 claims and recycle the desorbent to the first adsorption column to reduce the make-up desorbent and make the process more economical;

Although '714 claims do not include dehydrogenation step, the claims do produce ethyl benzene. Since ethyl benzene is the starting material for the production of styrene, it would have been obvious to one skilled in the art at the time the invention was made to modify '714 claims and include a dehydrogenation step to convert ethyl benzene and produce styrene due to its importance as a polymer feedstock.

Allowable Subject Matter

26. Claim 38 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

A process according to claim 21 wherein second stream (23b) is hydrogenated and then conveyed to an isomerization zone, is not taught or fairly suggested in the prior art.

Response to Arguments

27. Applicant's arguments filed 03/25/2008 have been fully considered but they are not persuasive.

28. The Applicant argues that the combined teachings of the cited references do not show all the elements of the processes claimed. For example, the step of dehydrogenating the raffinate product containing metaxylene, orthoxylene and ethylbenzene to obtain an effluent containing styrene, metaxylene, orthoxylene, unconverted ethylbenzene and by-products is neither taught nor suggested by the combined teachings of the cited references.

The Applicant's argument is not persuasive because Lee discloses, "Styrene is produced commercially by the catalytic dehydrogenation of ethyl benzene." (Column 1, lines 23-24). It is known to those skilled in the art that in the commercial practice the feed for dehydrogenation could comprise ethyl benzene and other components as claimed by the Applicant. Thus, the combined teachings of Magne-Dirsch and Lee disclose the claimed invention.

29. The Applicant's argument with respect to dehydrogenation "in absence of steam" is moot because of non-entered limitation.

30. The Applicant argues that by processing only pure ethylbenzene, the combined teachings of the cited references provide no hint or suggestion as to the outcome of processing mixtures of xylenes with ethylbenzene. One skilled in the art has no guidance as to whether other compounds in the mixture provide competing reactions with ethylbenzene or react with the styrene produced to reduce the total yield.

The Applicant's argument is not persuasive because Lee is using 99% pure ethylbenzene produced in Magne-Dirsch process (See column 8, lines 25-27) as feed for the dehydrogenation process. Thus, there are no other compounds in substantial amount to provide competing reactions and reduce the total yield of styrene.

31. The Applicant argues that the process of the present invention also provides a distinct reaction mixture of styrene, metaxylene, orthoxylene, unconverted ethylbenzene and by-products which requires separation of the styrene product. The combined teachings of the cited references do not disclose an equivalent step and therefore, provide no indication of how to separate styrene from such a reaction mixture. No evidence has been presented that the recovery of styrene from these mixtures at high purity levels of at least 99.8 % would be expected.

The Applicant's argument is not persuasive because Magne-Drisch produces a raffinate stream (3) comprising metaxylene, orthoxylene, and ethyl benzene which is passed through distillation (5) and adsorption (8) units to produce pure ethyl benzene, metaxylene, and orthoxylene (See figure and column 5, lines 16-35). The pure ethyl benzene thus obtained in Magne-Drisch process is dehydrogenated to pure styrene as disclosed in Lee process (See Office action for details). As fully discussed in the Office action, the difference between the Applicant's claim and combined Magne-Drisch/Lee invention is that the raffinate stream is first separated to obtain pure ethyl benzene and then dehydrogenating to pure styrene in the latter while dehydrogenating the raffinate stream and then separating styrene in the former. Combined Magne-Drisch/Lee invention is producing high purity paraxylene and styrene as claimed following similar process and using similar feed as claimed by the Applicant. It is only the sequence of steps, that differ. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (*selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results*).

32. The Applicant argues that combining the teachings of Magne-Dirsch and Lee, even with the benefit of hindsight, does not provide the dehydrogenation step or the separation step defined in all claims herein. The Examiner has provided no reason to ignore these critical imitations and has failed to provide sufficient evidence or reasoning to support a showing of *prima facie* obviousness.

The Applicant's argument is not persuasive because Magne-Dirsch has provided all the claimed separation steps and Lee has provided the dehydrogenation step. Thus, the combined teachings of Magne-Dirsch and Lee inventions provide all the critical limitations of the claimed invention and have established a *prima-facie* case of obviousness.

33. The Applicant argues that no evidence has been presented that either Lee or Magne-Dirsch mentions the use of a simulated bed.

The Applicant's argument is not persuasive because Magne-Dirsch discloses the use of a simulated moving bed (See column 5, lines 13-16).

34. With respect to claim 27, the Applicant argues that this claim defines methods where the adsorbent used to isolate styrene is an X or Y zeolite. As mentioned above, the cited references do not even mention isolating styrene, let alone using an absorption column to do so.

The Applicant's argument is not persuasive because Magne-Dirsch uses X and Y zeolites in the first adsorption column and a titanosilicate adsorbent in the second column for separation of ethyl benzene and xylenes. Combined invention of Magne-Dirsch and Lee will produce high purity styrene which could also be separated using similar adsorption units as discussed before.

35. The Applicant argues that the examiner has yet to address the subject matter of claim 42, wherein the said minor amount of ethyl benzene is about 7% by weight.

The Applicant's argument is not persuasive because the examiner has addressed the subject matter of claim 42 in the Office action dated 11/21/2007, paragraph bridging page 9 and 10. See Office action above, paragraph 20.

36. With respect to the obviousness-type double patenting, the Applicant argues that the claims of US Patent 6,841,714 do not include the dehydrogenation step or the isolation of styrene required of the methods claimed herein and no evidence has been presented to show or suggest it would be obvious for one skilled in the art to do so.

The Applicant's argument is not persuasive because Magne-Dirsch clearly discloses that ethyl benzene production line is generally integrated into a plant for producing styrene and polystyrene (See column 2, lines 35-37). On the other hand, Lee discloses, "It is well known that styrene is produced commercially by the catalytic dehydrogenation of ethyl benzene." (Column 1, lines 23-24) and "styrene can be homopolymerized to produce polystyrene" (Column 1, lines 21-22). Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the claims of '714 and add a dehydrogenation step to claim production of styrene and polystyrene.

Conclusion

37. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on MF 8:00 AM-4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

Art Unit: 1797

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PS 051108

/Glenn A Calderola/
Acting SPE of Art Unit 1797